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scopic lithology he has ever seen, and wonders how such a book could have been written by any man who had the slightest comprehension of a beginner's needs or who ever spent a day in a lithological laboratory.

Most of the plates that illustrate the book are of no use to the beginner, since, as a rule, no one except an expert could tell what rock they were intended to represent. The craze for photographic illustration in students' text-books, started by Rosenbusch, is one that should be frowned upon, in every case, except when the characters stand out boldly. The true way to assist the student is to have the plate show him what he is to look for. For this purpose it needs to be diagrammatic and exaggerated, so that the salient points will be grasped readily. In the present system the picture is commonly far more confusing than the original. A text-book is one thing, a volume illustrating original investigations another. The plates, poor as many of them are, in Harker's excellent little book, are of far more real value to a beginner than are any series of photographic prints ever published.

Turning to the engineer's side of this work, he will find it limited to a trifle over eight pages. This contains, for its space, quite a little useful information, but it is altogether too brief to be of much value. It is a great pity that this part could not have been enlarged and the remaining portions condensed.

No attempt is here made to point out the lame system of classification, the evident want of accurate acquaintance with lithological literature, or even with the rocks themselves. The reviewer's duty is not to criticize the book as a scientific treatise, but as a text-book for students wishing to obtain a working knowledge of rocks. The critic can but consider the work as a paste pot and scissors production, in which the materials were culled without judgment or real knowledge; and is the natural and legitimate result of a system in this country which allows in a university one man to hold two chairs, each of which demands all of his time and energy, however able he may be. Particularly is the system wrong when the two chairs are so diverse as mining engineering and geology. The subject of geology alone is too vast

even for a Baconian genius to do justice to it. It contains within its limits two parts or two sciences so different and so great that no college or technical school, and far less a university, can hope for a creditable standing in the geological world, which permits its geological department alone to be covered by one man, however eminent he may be. The butter has to be spread too infinitesimally thin for such a tremendous slice of bread.

The author of the work in question is not to blame, since nothing different ought to, or could, have been expected under the circumstances.

The only thing that the work can here be recommended for is, as a convenient manual in English, for the experienced lithologist to refresh his memory on some points.

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AMERICAN LINGUISTICS.

Langue Tarasque; Grammaire, Dictionaire, Textes. Par RAOUL DE LA GRASSERIE et NICOLAS LEON. *Bibliothèque Linguistique Americaine.* Tome XIX. pp. 293, Paris, Maisonneuve. 1896.

Die Maya-Sprachen der Pokom-Gruppe. ZWEITER THEIL. *Die Sprache der K'ekchi Indianer.* Von DR. OTTO STOLL. Pp. 221. Leipzig, Kohler. 1896.

The above are unusually valuable additions to the science of American linguistics. They present two North American languages hitherto little known to scholars, by careful analyses, according to the most approved methods of modern research.

The Tarascas were the native population of the State of Michoacan in Mexico when it was first discovered by the whites. They belonged among the semi-civilized tribes, though the language they spoke had no relationship to the Nahuatl, nor to any other on the continent. They erected important structures of stone, brick and mortar, and were sedentary and agricultural in habit.

Their language is characterized by the present writers as 'elegant and harmonious, rich and poetic.' Its phonetics are not difficult and its

morphology and syntax, though presenting some peculiarities, are not excessively complicated. It is incorporative in a high degree, a unique trait of its infixation being the incorporation in the verbal stem not only of the object, but of a generic particle which includes it. Another oddity is the attraction of the number of the object to that of the subject, as if we were to say, 'I teach him,' and 'we teach him.' The grammatic analysis is ably carried out. The dictionary, taken from that of Father Gilberti who wrote in the sixteenth century, occupies 150 pages, and the texts, mostly religious and therefore of secondary value, are sufficient to show how Europeans wrote the tongue. A bibliography is added and a slight sketch of the history of the tribe. Both the authors are well known by their previous valuable contributions to American studies.

The work of Dr. Stoll is a continuation of his fruitful contributions to the ethnography of Guatemala. The K'ekchi is a dialect of the Mayan stock still spoken in the department of Vera Paz, Guatemala, by about 85,000 natives. It stands in near relation to the Quiche-Cakchiquel group of the stock, but is sharply contrasted with these idioms by the wearing away of many of the forms, especially in suffix verbal derivatives. This suggests at once that with respect to them it is of modern formation.

The author devotes about a hundred pages to the grammar, which he analyses with the same thoroughness which characterized his former essay on the Pokomchi and the Ixil dialects. The vocabulary presents over three thousand words in correct phonetic form, based on a variety of authorities.

The volume closes with thirty pages devoted to the Uspanteca dialect. This is spoken in and near the village of San Miguel Uspantan, and was formerly included in the Quiche group; but Dr. Stoll shows that it is more closely connected with the Pokom group.

The interest attaching to this work is enhanced by the recent investigations into the archæology of the K'ekchi territory. Their ancestors probably erected the remarkable buildings at Copan, Quirigua and Tzac Pokoma; their pottery belonged to the most perfect on the continent; and the numerous mounds and sites throughout

their land still offer most attractive fields for exploration.

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SCIENTIFIC JOURNALS.

PSYCHE, SEPTEMBER.

A. P. MORSE continues his notes on the New England Tryxalinæ by a consideration of the genera *Chloealtis* and *Stenobothrus*, one species of each. F. L. HARVEY describes and figures a Thysanuran from Maine, possibly distinct from Packard's *Anoura gibbosa*. H. G. DYAR gives the life history of *Ichthyura strigosa* Grote. S. HENSHAW adds a new instalment of his bibliographical notes, being a list of the entomological articles in *Garden and Forest*, 1892-1895. The Proceedings of the Cambridge Entomological Club follow, the principal point of which is found in A. G. MAYER's account of the pigment in lepidopterous scales.

NEW BOOKS.

The Biological Problem of To-day. DR. OSCAR HERTWIG. Authorized Translation by P. Chalmers Mitchell. New York, The Macmillan Co. Pp. xix+148. \$1.25.

Text-book of Paleontology. CARL A. VON ZITTEL. Translated and Edited by Charles R. Eastman. Vol. I., Part I. Pp. 352, 593 Woodcuts. New York and London, The Macmillan Co. \$2.75.

A Geographical History of Mammals. R. LYDEKKER. Cambridge, University Press; New York, The Macmillan Co. 1896. Pp. xii+400. \$2.60.

The Principles of the Transformer. FREDERICK BEDELL. New York and London, The Macmillan Co. 1896. Pp. iv+416. \$3.25.

The Gas and Oil Engine. DUGALD CLERK. Sixth edition revised and enlarged. New York, John Wiley & Sons. Pp. xii+538.

Modern Optical Instruments. HENRY ORFORD. London, Whittaker & Co.; New York, The Macmillan Co. 1896. Pp. vi+100.

A Catalogue of 16,748 Southern Stars. LIEUT. J. M. GILLISS. Washington, Government Printing Office. Pp. xxxi+420.